

Preliminary Amendment

Applicant: Jeffery S. Beck et al.

Serial No.: Unknown (Parent Serial No. 09/808,763)

Filed: Herewith (Parent Filing Date March 15, 2001)

Docket No.: 10992120-4

Title: INTEGRATED CONTROL OF POWER DELIVERY TO FIRING RESISTORS FOR PRINTHEAD ASSEMBLY (As Amended)

IN THE CLAIMS

Please cancel claims 15-22 without prejudice.

Please amend claims 1-14, 23, and 26.

Please add claims 28-29.

1. (Currently Amended) An ~~inkjet~~ printhead comprising:
 - an internal power supply path;
 - a power regulator providing an offset voltage from the internal power supply path voltage; and
 - multiple primitives, each primitive including:
 - a group of nozzles;
 - a corresponding group of firing ~~resisters~~resistors; and
 - a corresponding group of switches controllable to couple a selected firing ~~resister~~resistor of the group of firing ~~resisters~~resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing ~~resister~~resistor to cause a corresponding selected nozzle to fire.
2. (Currently Amended) The ~~inkjet~~ printhead of claim 1 wherein the power regulator is a linear power regulator.
3. (Currently Amended) The ~~inkjet~~ printhead of claim 1 wherein each switch includes a field effect transistor (FET).
4. (Currently Amended) The ~~inkjet~~ printhead of claim 1 wherein the power regulator includes:
 - a digital-to-analog converter (DAC) coupled to the internal power supply path and configured to receive a digital offset command representing a desired offset voltage and to provide an analog offset voltage from the internal power supply path voltage.

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5. (Currently Amended) The ~~inkjet~~-printhead of ~~claim 4~~claim 1 wherein the power regulator further includes:

a buffer amplifier configured to receive ~~the~~an analog offset voltage and to provide a buffered offset voltage.

6. (Currently Amended) The ~~inkjet~~-printhead of claim ~~5~~1 wherein the power regulator further includes:

multiple ~~feedback~~-amplifiers corresponding to the multiple primitives, each ~~feedback~~ amplifier receiving ~~the buffered~~an input offset voltage and providing the offset voltage to a corresponding primitive.

7. (Currently Amended) The ~~inkjet~~-printhead of claim 6 wherein the printhead further comprises:

an internal power ground;

wherein each ~~feedback~~-amplifier includes a first input coupled to the ~~buffered~~input offset voltage, a second input coupled to the offset voltage, and an output; and

wherein the power regulator further includes:

multiple transistors, each transistor coupled between the internal power ground and the offset voltage and having a gate coupled to the output of a corresponding ~~feedback~~-amplifier.

8. (Currently Amended) The ~~inkjet~~-printhead of claim 7 wherein each transistor is a field effect transistor (FET).

9. (Currently Amended) The ~~inkjet~~-printhead of claim 6 wherein the printhead further comprises:

an internal power ground; and

wherein each ~~feedback~~-amplifier includes a first input coupled to the ~~buffered~~input offset voltage, a second input coupled to a feedback line, and an output coupled to a drive line;

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wherein each firing ~~resister~~resistor in a primitive includes a first terminal coupled to the internal power supply path and a second terminal;

wherein the group of switches in each primitive include subgroups of switches, each subgroup of switches corresponding to a firing ~~resister~~resistor and including:

a power transistor coupled between the second terminal of the firing ~~resister~~resistor and the internal power ground and having a control gate;


a first switch coupled between the drive line and the control gate of the power transistor; and

a second switch coupled between the feedback line and the second terminal of the firing resistor.

10. (Currently Amended) The ~~inkjet~~ printhead of claim 9 wherein the power transistor is a field effect transistor (FET).

11. (Currently Amended) The ~~inkjet~~ printhead of claim 4 wherein the DAC is a current-mode DAC.

12. (Currently Amended) The ~~inkjet~~ printhead of claim 4 further comprising: a processor supplying the digital offset command.

13. (Currently Amended) An ~~inkjet~~ printhead assembly comprising: 
at least one printhead, each printhead including:

an internal power supply path;

a power regulator providing an offset voltage from the internal power supply path voltage; and

multiple primitives, each primitive including:

a group of nozzles;

a corresponding group of firing ~~resisters~~resistors; and

a corresponding group of switches controllable to couple a selected firing ~~resister~~resistor of the group of firing ~~resisters~~resistors between the

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internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing ~~resister~~resistor to cause a corresponding selected nozzle to fire.

14. (Currently Amended) The ~~inkjet~~-printhead assembly of claim 13 wherein the at least one printhead includes multiple printheads.

15.-22. (Cancelled)

23. (Currently Amended) A method of operating an inkjet printing in an inkjet printhead comprising:
providing an internal power supply path;
providing an offset voltage from the internal power supply path voltage;
coupling a selected firing ~~resister~~resistor of a group of firing ~~resisters~~resistors between the internal power supply path and the offset voltage to cause electrical current to pass through the selected firing ~~resister~~resistor to cause a corresponding selected nozzle to fire.

24. (Original) The method of claim 23 wherein providing the offset voltage includes:
converting a digital offset command representing a desired offset voltage to an analog offset voltage from the internal power supply path voltage.

25. (Original) The method of claim 24 wherein providing the offset voltage further includes:
buffering the analog offset voltage.

26. (Currently Amended) The method of claim ~~25~~23 wherein providing the offset voltage ~~further~~ includes:
receiving the ~~buffered analog~~analog input offset voltage at a feedback amplifier; and
providing the offset voltage with the feedback amplifier.

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27. The method of claim 24 further comprising:
supplying the digital offset command.
28. (New) A fluid ejection device comprising:
an internal power supply path;
a power regulator providing an offset voltage from the internal power supply path voltage;
a group of nozzles;
a corresponding group of firing resistors; and
a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.
29. (New) The fluid ejection device of claim 28 wherein the group of nozzles, the corresponding group of firing resistors, and the corresponding group of switches are contained in a first primitive, and the fluid ejection device comprises a second primitive including a second group of nozzles, a second group of firing resistors, and a second group of switches controllable to couple a selected firing resistor of the second primitive between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor of the second primitive to cause a corresponding selected nozzle of the second primitive to fire.